

ABSTRACT

THESIS: Influence of drop height and fatigue on landing mechanics in recreationally active females

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Multiple factors have been shown in isolation to affect landing mechanics and increase the risk for anterior cruciate ligament (ACL) injuries including gender, fatigue and drop jump height. However, there is a gap in the literature on the interaction of these factors. The purpose of the current research was to identify the combined effects of drop height and fatigue on landing mechanics in recreationally active females. Subjects participated in a muscular fatiguing protocol and a series of drop jumps from a range of heights before and after fatiguing exercises.

Kinematic results from this study demonstrated that hip flexion decreased at initial contact, and knee flexion and hip flexion increased in the maximum position as drop height increased. As a result of fatigue, knee valgus in the maximum position increased along with vertical ground reaction forces and loading rate. These increased ground reaction forces were observed with drop height as well. Interaction effects were observed in the peak frontal plane ankle moment and frontal plane hip angle at impact suggesting that fatigue and drop height do have a combined effect on landing mechanics. Athletes and coaches can use this information to design optimal training and injury prevention programs by implementing various heights and states of fatigue in their training in order for the athlete to improve their landing mechanics in these high injury risk situations.